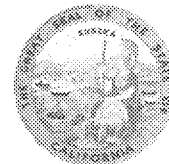




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State of California—Health and Human Services Agency  
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GAVIN NEWSOM  
Governor

**DATE:** March 19, 2021

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3/19/21

**SUB:** CDPH-EMB review of *Parcel B Draft Radiological Rework Work Plan*, Hunters Point Naval Shipyard, San Francisco, CA. Received January 5th, 2021.

As submitted by the California Department of Toxic Substances Control (DTSC), Environmental Management Branch (EMB) of the California Department of Public Health (CDPH) reviewed the *Parcel B Draft Radiological Rework Work Plan*, Hunters Point Naval Shipyard, San Francisco for radiological issues. This review was performed in support of the Interagency Agreement between DTSC and CDPH.

If you need further assistance, please contact Terry Han at (916) 210-8531 or via email at [Terry.Han@cdph.ca.gov](mailto:Terry.Han@cdph.ca.gov).



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The Environmental Management Branch (EMB) of the California Department of Public Health (CDPH) appreciates the opportunity to review the submitted document, *Draft Parcel B Removal Site Evaluation Work Plan*, Hunters Point Naval Shipyard, San Francisco, CA. Received January 5th, 2021.

### General Comments

1. Please note that CDPH-EMB uses the following criteria in Title 17 of the California Code of Regulations, Section 30256(k) [17 CCR § 20256(k)] to base its evaluation for issuing a Radiological Unrestricted Release Recommendation (RURR):
  - (1) Radioactive material has been properly disposed;
  - (2) Reasonable effort has been made to eliminate residual radioactive contamination, if present, and;
  - (3) A radiation survey has been performed which demonstrates that the premises are suitable to release for unrestricted use; or other information submitted by the licensee is sufficient that the premises are suitable for release for unrestricted use.

### Specific Comments:

2. **Section 3.1 “Data Quality Objectives, Step 4 – Define the Study Boundaries”, Page 3-1, Paragraph 4, Sentence 1:**

“See Phase 1 and Phase 2 TUs and surface soil survey units (SUs) listed in Tables 3-1 through 3-3 and shown on Figure 3-1.”

Since TU-4, 26, 33, 36, 48 and 131 were not recommended by the Navy nor EPA/CDPH/DTSC for excavation, CDPH requests Navy to move TU-4, TU-26, TU-33, TU-36, and TU-131 from Phase 1 to Phase 2 of evaluation.

In exchange, since TU-19, 42, 51A, 53, 55, and 60 were recommended by EPA/CDPH for resampling, CDPH requests Navy to move TU-19, TU-42, TU-51A, TU-53, TU-55 and TU-60 from Phase 2 to Phase 1 of evaluation.

3. **Section 3.1 “Data Quality Objectives, Step 5 – Develop a Decision Rule”, Page 3-2, Bullet Points:**

Following USEPA’s 2018 comment on *Draft Work Plan, Radiological Survey and Sampling, Former Hunters Point Naval Shipyard, San Francisco, California*,

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February 2018, CDPH requests Navy to add another bullet point in a language similar to "If multiple Phase 2 survey units / trench units have contamination, then additional survey units / trench units may need 100% full excavation and treatment in a manner similar to Phase 1."

4. **Section 3.1 "Data Quality Objectives, Step 5 – Develop a Decision Rule", Page 3-2, Bullet Points and Appendix A, SAP Worksheet #11 – "Project Quality Objectives/Systematic Planning Process Statements (Continued), Step 5 Develop the Analytical Approach", Page 41:**

Please clarify the discrepancy in the decision rules listed in Section 3.1, Step 5 and SAP Worksheets #11, Step 5.

5. **Section 3.3 "Remediation Goals", Page 3-4, Sentence 1:**

"The soil data from the radiological investigation will be evaluated to determine whether site conditions are compliant with the RAO in the Parcel B ROD (Navy, 2009)."

The soil data should be evaluated against all Parcel B RODs available.

6. **Section 3.3 "Remediation Goals", Page 3-4, Table 3-5:**

Please add a footnote to Table 3-5 to clarify the Ra-226 RG is 1 pCi/g above background, in accordance with Parcel B ROD.

7. **Section 3.3.1 "Investigation Levels", Page 3-5, Paragraph 2, Sentence 5:**

"The analysis of gamma scan data collected by the RS-700 mobile gamma-ray detection system and triggers for further investigation are described in Section 3.5.1.1. ILs for other field instrumentation are typically equal to an upper estimate of the instrument and material-specific background, such as the mean plus three standard deviations."

Please specify where the background (or reference) data will be obtained from.

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8. **Section 3.4.2 “Locating Samples”, Page 3-8, Paragraph 1, Sentence 2:**

“The systematic soil samples will be plotted using a random start square grid using the VSP software (or equivalent) with GPS coordinates for each systematic sample.”

Please explain the reason of using square grid instead of the triangle grid finalized in Hunters Point Parcel G Work Plan.

9. **Section 3.4.3 “Radiological Background”, Page 3-8, Paragraph 1, Sentence 1:**

“The RGs presented in Table 3-5 are incremental concentrations above background; therefore, RBA samples and measurements will be collected and evaluated to provide generally representative data sets estimating natural background and fallout levels of man-made radionuclides for the majority of soils at HPNS.”

According to Table 8-4 in *Parcel B Amended Record of Decision, Hunters Point Shipyard, San Francisco, California 2009*, the RGs for Radionuclides in Table 3-5 are NOT incremental concentrations above background, except Ra-226 RG being 1 pCi/g above background. Please correct the language in the 1<sup>st</sup> sentence specified in this comment.

10. **Section 3.4.4 “Phase 1 Trench Unit Design”, Page 3-9, Paragraph 2, Sub-bullet Point 1:**

“- Material thickness will not exceed 6 inches.”

Please clarify if the thickness of former trench sidewall and floor soil on RSY pad will exceed 6 inches.

11. **Section 3.4.4.2 “Size of Phase 1 Trench Units”, Page 3-10, Paragraph 2, Sentence 1:**

“Therefore, an individual ESU or SFU volume will not exceed 152 m<sup>3</sup>.”

Please clarify if the 152 m<sup>3</sup> result is applicable if the soil thickness is more than 6 inches, and how the 152 m<sup>3</sup> volume will be maintained if the soil thickness is more than 6 inches.

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**12. Section 3.4.5 “Phase 2 Trench Unit Design”, Page 3-11, Paragraph 3, Sentence 2”:**

“A stylized graphic of an example Phase 2 TU with 18 systematic boring locations placed using a square grid is shown on Figure 3-4.”

Please explain the reason of using square grid instead of the triangle grid finalized in Hunters Point Parcel G Work Plan.

**12. Section 3.5.1.1 “RS-700 Gamma Scan Data Analysis”, Page 3-14, Paragraph 2, Sentence 9:**

“Any location with four or more ROIs having a Z-Score, local Z-score, or semi-local Z-score, respectively, greater than 3 ( $Z > 3$ ) is marked for follow-up.”

Please describe what kind of investigations have been proposed for “follow-up”.

**13. Section 3.5.2.3 “Example Gamma Scan Minimum Detectable Concentrations”, Page 3-16, Last Sentence:**

“The  $MDCR_{surveyor}$  was then calculated assuming a surveyor efficiency ( $\rho$ ) of 1 (assumes automated data logging).”

Please explain how the surveyor efficiency ( $\rho$ ) of 1 can be achieved. MARSSIM recommends that a surveyor efficiency assumption should be between 0.5 and 0.75.

**14. Section 3.5.2.3 “Example Gamma Scan Minimum Detectable Concentrations”, Page 3-17, Table 3-7:**

Gamma scan MDC calculations of Ra-226 and Cs-137 for 9-inch soil depth for Ludlum 44-20, 3x3 are not included in the Table 3-7.

If Navy plans to use Ludlum 44-20, 3x3 or equivalent, to make scan or static measurement on 9-inch soil, please provide the MDC calculations of these instruments for both Ra-226 and Cs-137 for 9-inch soil depth.

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**15. Section 3.5.2.3 “Example Gamma Scan Minimum Detectable Concentrations”, Page 3-17, Paragraph 3, Sentence 7:**

“In Table 3-7, the calculated gamma scan sensitivity for Cs-137 is not expected to be sufficient to detect Cs-137 at or below the RG. Therefore, compliance with the Parcel B ROD RAO for Cs-137 will be based on the analytical data from soil sampling.”

Please explain the method of analytical data for Cs-137 soil sampling compliance.

**16. Section 4.1 “Data Quality Objectives, Step 7-Develop the Plan for Obtaining Data”, Page 4-2:**

“Radiological investigations will be conducted on floors, wall surfaces, and ceiling surfaces of Buildings 103, 113, 113A, 130, and 146; and on accessible interior surfaces of Building 140 consistent with the *Technical Memorandum to Support Unrestricted Radiological Release of Building 140 Including the Suction Channel and Discharge Piping* (TtEC, 2011). “

Please provide justification why radiological investigation of these buildings only focusing on interior while excluding exterior of the building.

**17. Section 4.4.3 “Survey Units”, Page 4-7, Table 4-4:**

The title of Table 4-4, Building 140 Summary Table, appears to be inconsistent with the content in the table. Please modify the title or the content as needed.

**18. Section 4.5.5 “Instrument Efficiencies”, Page 4-10, Paragraph 1, Sentence 2:**

“These parameters will be updated as appropriate during the investigation for each instrument used.”

To facilitate the review process, CDPH requires Navy to include the instrument calibration reports that document the calculation and result of 2pi efficiencies utilized in the calculation of MDC during the investigation and remediation process in any future report. At the same time, CDPH requires Navy to maintain the same measurement method and geometry when measuring the instrument efficiency and taking readings in survey area during the investigation and remediation process.

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**19. Section 4.5.5 “Instrument Efficiencies”, Page 4-10, Table 4-5:**

Table 4-5 shows 0.90 beta total efficiency ( $4\pi$ ) for Sr-90/Y-90, Cs-137, and Tc-99.

Please provide the reference document on how 0.9 ( $4\pi$ ) total efficiency was calculated or reported.

**20. Section 4.5.5 “Instrument Efficiencies”, Page 4-11, Paragraph 1, Sentence 9 and Page 4-12, Table 4-6:**

“Since radon ( $^{222}\text{Rn}$ ) is a gas, a fraction of its concentration may escape the building area before decaying...” and Rn222’s Equilibrium Fraction value of 1.0 in Table 4-6.

Please explain how a fraction of Rn222 may escape the building before decaying while the equilibrium fraction can still be assumed to be 1, or 100% in Table 4-6.

If the equilibrium fraction of Rn222 is adjusted, please modify the equilibrium fraction of its progenies accordingly.

**21. Section 4.5.5 “Instrument Efficiencies”, Page 4-12, Table 4-6:**

Please provide the reference document or detailed calculation steps for all the estimated  $4\pi$  efficiencies for all the instruments listed in Table 4-6.

**22. Section 4.5.8.4 “Probability of Alpha Detection for Small Area Detectors”, Page 4-17, Equation 4-4:**

In the calculation of Equation 4-4, total efficiency value taken from Table 4-6 as  $E=0.602$ . However, total efficiency of Ludlum Model 43-68 in Table 4-6 shows  $E=0.560$ .

Please explain the discrepancy and make additional changes throughout to the document to reflect the correct total efficiency value.

**23. Section 4.5.8.4 “Probability of Alpha Detection for Small Area Detectors”, Page 4-18, Equations 4-5 and 4-6:**

In the denominator of the Equation 4-5; detector ( $\epsilon_{d,i}$ ) and surface ( $\epsilon_{s,i}$ ) efficiencies are included and consistent with MARSSIM Equation 6-10. However, in the following Equations of 4-6 and 4-7 detector total  $4\pi$  efficiency has been used.

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Please provide explanation how different type of surfaces can be accounted using 4-pi efficiency in Equation 4-6 and 4-7.

**24. Section 4.5.8.8 “Beta Static Minimum Detectable Concentration”, Page 4-21, Paragraph 2, Sentence 1 and the footnote of Table 4-9:**

“The alpha and beta static MDCs for each survey instrument and ROC are presented in Table 4-9 for 1-minute measurements in the SUs and RBAs.” On the other hand, a footnote of Table 4-9 states that “SU background static measurement count times = 2 minutes.”

Please explain this discrepancy.

**25. Section 4.5.8.8 “Beta Static Minimum Detectable Concentration”, Page 4-21, Table 4-9:**

Please provide all input parameters that were used for calculation of MDC in Table 4-9.

**26. Section 4.6.3.2 “Survey Unit and Reference Background Area Alpha-Beta Scanning”, Page 4-24, Last Sentence:**

“The scan rates for other planned instruments (e.g., Ludlum Model 43-37 and Ludlum Model 43-68) are manually controlled by the surveyor and will be verified manually in each SU by direct observation and measurement of the time elapsed while scanning a known distance.”

Please describe a method that Navy will document and provide the verification of scan rate achieved during the field work.

**27. Section 4.6.3.2 Survey Unit and Reference Background Area Alpha-Beta Scanning, Page 4-24 Last Sentence:**

“The scan rates for other planned instruments (e.g., Ludlum Model 43-37 and Ludlum Model 43-68) are manually controlled by the surveyor and will be verified manually in each SU by direct observation and measurement of the time elapsed while scanning a known distance.”

Please provide justification on how the proper scan rate will be derived and calculated.



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28. **Section 4.6.3.3 “Survey Unit Systematic Alpha-Beta Static Measurements”, Page 4-25, Paragraph 3, Sentence 1:**

“Each static measurement will be performed in scaler mode for a count duration sufficient to ensure that the alpha and beta static MDCs are equal to or less than the  $RG_a$  and  $RG_b$  for the building, respectively.”

Please provide explanation how this method can accommodate various types of surfaces present in the building.

29. **Section 5.6 “Determine Equilibrium Status”, Page 5-11, Sentence 1:**

“...analyzing a sample for multiple radionuclides from the series using the same or comparable analytical techniques.”

Please describe what are the analytical techniques that you are referring to.

30. **Appendix A “SAP Worksheet #37 – Usability Assessment (Continued)”, Page 177, Paragraph 2, Sentence 1:**

“The DL is the minimum quantity of an analyte that can be reliably distinguished from background noise or from zero for a specific analytical method at a 99 percent confidence level.”

Please give explanation and detail of the specific analytical method that ensures a 99 percent confidence level is achieved.

31. **Appendix C, Attachment 1, “Radiation Instruments and Equipment, C.6 Minimum Detectable Concentration”, Page 6, Bullet Point 2:**

“Alpha/Beta Smears of Building and Structure Surfaces – The MDC for smear counting is calculated as described above for static measurements, in units of dpm/smear, but with  $\epsilon_i$  and  $\epsilon_s$  terms replaced by the smear counter’s calculated  $4\pi$  detection efficiency ( $\epsilon_T$ ).”

Please give explanation when  $\epsilon_i$  and  $\epsilon_s$  terms are replaced by  $4\pi$  detection efficiency ( $\epsilon_T$ ), how the smear counting can accommodate to the potential removable contamination from different types of surfaces.